

IV. *Descriptions of new species of Indian Aculeate Hymenoptera, collected by Mr. G. R. JAMES ROTHNEY, Member of the Entomological Society.*
By FREDERICK SMITH.

[Read 15th March, 1875.]

TWENTY-SIX new species of Indian *Hymenoptera* are described in this paper, and of four or five described species the sex, hitherto unknown, is added. Guérin-Méneville, in the *Iconographie du Règne Animal*, described an aberrant species of ant, belonging to the family *Cryptoceridæ*, naming it *Cryptocerus bicolor*; this was a worker, the male and female being at that time unknown. In 1853 I published, in the *Transactions of this Society*, a revision of the family, finding it necessary to establish two new genera; to one of these, *Meranoplus*, I transferred Guérin's species, which came from Pondicherry. Mr. Rothney found the insect in the Botanic Gardens at Calcutta. The nests he describes as difficult to find. Finding a few, however, he visited them almost daily for some months. They are made in the ground, at a depth of several inches. Not observing any other than workers at the mouths of the burrows, he determined to dig down and ascertain their contents. At the end of May, 1873, he succeeded in obtaining several males, but only one female. Whether more are to be found at any time remains undetermined. A second female was subsequently taken at Barrackpore. These are all that have rewarded a three seasons' industrious search. All the sexes are figured in the plate that illustrates this paper.

Another highly interesting insect, discovered by Mr. Rothney, is the female of *Pseudomyrma bicolor*, the winged female not having been previously discovered.

A new species of the genus *Methoca* is a valuable addition to the Indian *Mutillidæ*. Thirteen new species of fossorial *Hymenoptera* are here described—nine of *Andrenidæ*, and six of *Apidæ*. The most interesting insect among the species of *Andrenidæ* is one having capitate antennæ; it is closely allied to the genus *Nomia*, but is distinct, having only two submarginal cells in the anterior

wings; the tongue is conformable to that of the species belonging to the genus *Nomia*, and the posterior legs of the males are swollen and curved as in that genus. We are now acquainted with five species of bees, the males of which have capitate antennæ: they are *Nomia Kirbii*, Sm.; *Nomia antennata*, Sm.; *Thaumatostoma Duboulaii*, Sm.; *Tetralonia mirabilis*, Sm.; and *Cyathocera nodicornis*.

A * is prefixed to the species of which the types are in the National Collection.

CRYPTOCERIDÆ.

Genus MERANOPLUS, Smith.

Meranoplus bicolor, Smith, Trans. Ent. Soc. Lond. 2nd ser. ii. 224, 1, ♂ (1853); Cat. Hym. Ins. pt. vi. Formicidæ, 193.

Cryptocerus bicolor, Guér. Icon. Règ. Anim. 425, ♀ (1844). (Pl. I., figs. 1♂, 2♀, 3♂, 1a♂, 2a♀.)

Female.—Length $3\frac{1}{2}$ lines. The head, antennæ, thorax and nodes of the petiole of the abdomen ferruginous. Head rugulose, with confluent punctures, which run into longitudinal reticulation; the scape of the antennæ slightly fuscous above. The thorax with confluent punctures; a fuscous spot on the mesothorax anteriorly; also a similar lateral spot near the tegulæ; wings flavo-hyaline; the nervures testaceous; the stigma fuscous; the legs rufopiceous; the tibiæ and femora darkest. Abdomen thinly covered with short pale pubescence, and having a few longer hairs intermixed, particularly towards the apex.

Male.—Length 2 lines. Head and abdomen nigropiceous; the thorax rufopiceous; the region of the scutellum more or less fuscous; the ocelli large, prominent, and of a pale glassy brightness; the antennæ and legs pale testaceous; wings flavo-hyaline; nervures and stigma pale testaceous; the abdomen with a very sparing, scattered, pale pubescence.

Hab.—Eden Gardens, Calcutta.

To Mr. Rothney science is indebted for the discovery of the male and female sexes of *Meranoplus bicolor*. With great care and labour they were dug out of the nest in the solid ground, but only one of each sex was secured.

Pseudomyrma bicolor. (Pl. I., fig. 4.)

Pseudomyrma bicolor, Guér. Icon. Règ. Anim. 427, ♂;
Smith, Cat. Hym. Ins. pt. 6,
Formicidæ, 153; Trans. Ent.
Soc. Lond. new ser. iii., 157, ♂.

Sima rufo-niger, Roger, Berl. Ent. Zeitschr. vii. 1864.

Female.—Length 5 lines. The head, femora, intermediate and posterior tibiæ and the abdomen black; the antennæ, mandibles, tarsi, anterior tibiæ and base of the two following pairs pale ferruginous; the thorax and two nodes of the abdomen ferruginous; the anterior wings fusco-hyaline; the posterior pair clear hyaline; the nervures of the anterior pair fuscous, palest at the base of the wings; the stigma dark fuscous. For the neuration, see the figure in plate.

Roger separated this insect from the genus *Pseudomyrma*, creating the genus *Sima* for its reception; but, in my opinion, on insufficient generic characters. Finding on comparison with six species of *Pseudomyrma*, some of which are retained in that genus by Roger, that the neuration of the wings in *P. bicolor* is identical with the others, I do not adopt the proposed generic name. The male of this species is unknown to me.

MUTILLIDÆ.

Methoca orientalis.

Male.—Length $3\frac{1}{3}$ lines. Black and shining; wings hyaline; the nervures and stigma black. Antennæ as long as the head and thorax, thickened in the middle; the face closely punctured, the vertex more sparingly so; the mandibles rufo-piceous; the palpi pale testaceous; the entire insect with a thin, scattered, griseous pubescence, particularly the head and thorax. Thorax: the pro- and meso-thorax anteriorly with fine, rather distant punctures; the posterior portion of the mesothorax with transverse, somewhat coarse striæ; the metathorax rugose; the tarsi obscurely testaceous. Abdomen very smooth and shining; the margins of the segments constricted.

This insect closely resembles the *Methoca ichneumonoides* of Europe; but its antennæ are thicker, and the transverse striation of the mesothorax distinguishes it. It is the first species of the genus I have any knowledge of from India.

Tribe FOSSORES.

SCOLIADÆ.

Elis thoracica.

Tiphia thoracica, Fabr. Ent. Syst. Supp. 254, ♀.

Elis thoracica, Sauss. et Sichel, Cat. des Espèc.
Scolia, 188, ♀.

Male.—Length 8 lines. Black, with dense cinereous pubescence; the first four segments of the abdomen with sparing pubescence of the same colour, and the apical margins of the segments fringed with the same; the three apical segments with black pubescence. The clypeus yellow, with a large triangular black spot, from which a short line runs to the anterior margin; the mandibles with their apex rufo-piceous. Thorax: the posterior margin of the prothorax yellow in the middle, not extending to the tegulæ; a slightly interrupted line at the base of the scutellum, a spot on the post-scutellum, the tibiæ outside and the femora at their apex yellow; the wings fulvo-hyaline, the nervures dark brown. The first segment of the abdomen yellow above, with the base and sides narrowly black; the second also yellow, with the base black; the black produced more or less in the middle into an angular shape, and continued obliquely at the sides towards the apical margin of the segment, but not reaching to it; the third segment is similarly coloured, but the black base is broader; the fourth has a narrow yellow fascia, sometimes slightly interrupted in the middle; the black colouring has more or less of a blue, green and violet tinge.

Elis hirsuta, Sauss. Cat. des Espèc. Scolia, 200, ♀.

Male.—Length $3\frac{1}{4}$ — $4\frac{1}{2}$ lines. Black, the abdomen iridescent; the apical margins of the segments with yellow fasciæ. Covered with a thin cinereous pubescence; the mandibles and clypeus yellow; the latter with a black spot in the middle, and the former rufo-piceous at their apex; the antennæ fulvous beneath. The prothorax has a yellow line, which extends to the tegulæ; the scutellum and post-scutellum yellow; the apex of the femora and the tibiæ outside yellow; the tarsi rufo-testaceous; the wings hyaline, the nervures ferruginous. The fasciæ on the second and third segments widen abruptly laterally

into large sub-ovate forms, the middle of the fasciæ being of equal width; all the segments with a long cinereous fringe; the apical segment ferruginous above.

The female of this species is described by Saussure in the *Cat. des Espèces*. *Scolia*, but he does not give the size, which varies in a series from three and a half to six lines; it is black and shining; its pubescence cinereous; the head convex, smooth and shining; the thorax strongly punctured; the scutellum impunctate; the legs very pilose; the wings hyaline, the nervures ferruginous; the first four segments of the abdomen fringed with white pubescence.

POMPILIDÆ.

Agenia festinata.

Female.—Length $5\frac{1}{2}$ lines. Black, with a silvery pile, observable in certain lights; wings hyaline, with a fuscous cloud, which occupies the basal half of the marginal cell, and descends into the third discoidal cell. The head, below the insertion of the antennæ, covered with bright silvery pile; the mandibles rufo-piceous at their apex; the palpi obscurely testaceous. Thorax: the metathorax finely striated transversely; the wings hyaline; the anterior pair with a slight fulvous tint, and their apical margins slightly fuscous. Abdomen petiolated, the petiole short.

Priocnemis peregrinus.

Female.—Length $9\frac{1}{2}$ lines. Black: the head, antennæ, pro- and meso-thorax, tegulæ and scutellum ferruginous; the legs of the same colour, except the coxæ, trochanters and extreme base of the femora, which are black; the mandibles ferruginous, with their tips black; the metathorax transversely striated, and with a longitudinal central channel; the wings brown, with a bright violet iridescence.

Male.—Length 6—7 lines. Closely resembling the female; but with the vertex of the head more or less fuscous, or black; the mesothorax and scutellum more or less obscure, sometimes quite black; the femora are also black, except towards their apex; three or sometimes four of the apical joints of the tarsi black; five or six of the apical joints of the antennæ black.

This insect was found at Calcutta, by Mr. Rothney; it also occurs in Sumatra and at Hong Kong.

Hab.—Barrackpore, &c.

Mygymia Atropos.

Male.—Length $6\frac{1}{4}$ lines. Black: mandibles and antennæ ferruginous; the latter more or less fuscous above. The thorax, in certain lights, with an obscure purple tinge; the anterior tibiæ and tarsi, and the extreme apex of all the femora, ferruginous; the wings blackish-brown, with a bright blue and violet iridescence; an obscure ocellated spot in the first discoidal cell; the metathorax with a few slight transverse carinæ. Abdomen slightly shining.

CRABRONIDÆ.

Trypoxylon accumulator.

Female.—Length $6\frac{1}{2}$ lines. Black: the apex of the first, and the second and third segments entirely, ferruginous. Head: the palpi pale testaceous; the mandibles pale testaceous at their base and ferruginous towards their apex; the flagellum of the antennæ, except the two first joints, fulvous beneath; the clypeus and face, as high as the sinus of the eyes, covered with silvery-white pubescence. Thorax smooth and shining above; the metathorax with a deep central longitudinal fovea, which extends from the base to the apex, and is widest in the middle; the sides of the metathorax with a thin white pubescence, there is also a little on the thorax beneath and on the legs; the anterior and intermediate tarsi, the anterior tibiæ in front, the intermediate pair at their base and apex, and the posterior pair at their apex, as well as all the spurs of the tibiæ, pale rufo-testaceous; the base of the joints of the posterior tarsi pale; the wings hyaline, faintly clouded at their apex, the nervures black; the tegulæ rufo-testaceous. Abdomen smooth and shining.

Oxybelus squamosus.

Female.—Length 3 lines. Black, spotted and banded with yellow. Head: the scape in front and the mandibles yellow; the latter ferruginous at their tips; the antennæ fulvous; very closely punctured. Thorax shining, strongly, but not very closely punctured; an ovate spot on each side of the scutellum, and a squama beneath each on the post-scutellum, yellow; at the posterior margin of the latter is a larger squama of a bright red, coppery colour, notched at the apex; the anterior femora beneath,

and the posterior tibiae at their apex outside, yellow. The wings hyaline, their nervures ferruginous. Abdomen: a broad yellow band on the apical margins of the first four segments, all interrupted, the two first most widely so; shining and punctured.

Male.—Rather smaller, but very like the female; the tibiae and tarsi yellow, and more or less ferruginous beneath.

LARRIDÆ.

Astata agilis.

Female.—Length $3\frac{1}{2}$ lines. Head, thorax and legs shining black; abdomen ferruginous, with the apex black. Head: the mandibles ferruginous in the middle; the face with a silvery-white pubescence; a little, thin, long pubescence of the same on the cheeks and hinder margin of the vertex. On the prothorax, anterior margin of the mesothorax, the sides of the thorax and also beneath, a thin, long, silvery pubescence; the metathorax above with divergent striæ, which are reticulated between, the apex truncate; wings hyaline, with a fuscous cloud beyond the stigma, the extreme apical margin pale; the tarsi rufopiceous. The abdomen smooth and shining.

Hab.—Nischiudipore.

NYSSONIDÆ.

Gorytes amatorius.

Female.—Length $3\frac{1}{4}$ lines. ^{7mm}Black, variegated with white and ferruginous. Head: the face as high as the insertion of the antennæ and the scape in front white; the mandibles ferruginous, the scape of the antennæ fulvous beneath; the cheeks and clypeus with a silvery pile. Thorax: a narrow line on the collar, the tubercles, a spot on the mesothorax close to the tegulæ and the post-scutellum white; the legs ferruginous, with the tibiae, tarsi and the apex of the anterior and intermediate tibiae beneath white; the tibiae more or less ferruginous; the claw-joint of the posterior tarsi black; wings hyaline and iridescent. Abdomen: the basal segment ferruginous, black above towards the apex, and with a narrow, white, interrupted fascia on its apical margin; the three follow-

ing segments with narrow white fasciæ, the first widened laterally; the third not extending to the lateral margins.

* *Gorytes tricolor*.

Female.—Length 4 lines. Head black, thorax ferruginous, both with yellow markings; abdomen of three colours—ferruginous, yellow and black. Head: the antennæ, anterior margin of the clypeus and tips of the mandibles ferruginous; the extreme apex of the antennæ black; the clypeus and mandibles, a short narrow line behind the eyes and a broader one at their inner orbits yellow, the latter ferruginous towards the clypeus. The prothorax above, a spot before the tegulæ, the scutellum and post-scutellum, the claw-joint of the anterior tarsi, and the intermediate and posterior tibiæ in front, yellow; the enclosed space at the base of the metathorax longitudinally striated; the legs ferruginous; the wings hyaline, with a dark fuscous spot occupying the marginal, second submarginal and a portion of the third submarginal cells. Abdomen: the two basal and the apical segment ferruginous; the third and fourth segments yellow, the fifth black; the first segment with a yellow margin at fascia, not extending to the lateral margins, and much narrowed in the middle; this band is sometimes obsolete; the second segment has a yellow marginal fascia, narrow in the middle and much widened laterally; the basal margin of the third segment black.

Male.—Greatly resembles the female, but has the scape of the antennæ, the mandibles, as well as the clypeus and inner orbits of the eyes, yellow; the coxæ, trochanters, tibiæ and tarsi are also yellow, the tibiæ being more or less ferruginous or black behind. The first four segments of the abdomen have a yellow fascia on their apical margins, greatly widened laterally; the third and following segments otherwise black.

* *Cerceris viscosus*.

Female.—Length 5 lines. Ferruginous, variegated with bright yellow, the tips of the anterior wings dark fuscous. Head: a large oblong spot behind the eyes, the clypeus, which is elevated, the face on each side of it, a line between the antennæ terminating in a round spot at the anterior ocellus, the scape in front and the mandibles

yellow; the antennæ ferruginous. Thorax: an interrupted line on the collar, a spot on the tegulæ, two ovate ones beneath the wings, two minute ones on the scutellum, the post-scutellum and a line on each side of the metathorax, yellow; the legs yellow, the femora above and the apex of the tibiæ ferruginous. The first segment of the abdomen, and a central triangular spot which crosses the three following segments, ferruginous; the apical segment also ferruginous, otherwise yellow.

* *Cerceris rufinodis*.

Male.—Length $4\frac{1}{2}$ lines. Black, variegated with yellow, the basal segment of the abdomen red; strongly punctured. Head: the front clypeus, scape in front, mandibles and a spot behind the eyes, yellow; antennæ fulvous, more or less fuscous above. Thorax: the collar, tegulæ, scutellum and post-scutellum, an oblong spot at the sides of the metathorax, two spots beneath the wings, one on the pectus, and the legs, yellow; a black spot at the base of the anterior and intermediate femora above; the apex of the posterior femora and tibiæ black, their tarsi fuscous; wings hyaline, with a dark fuscous stain at the apex of the anterior pair. The second and following segments of the abdomen with yellow marginal fasciæ, attenuated in the middle and sub-interrupted; the fasciæ continued beneath the abdomen, which is there rufo-testaceous.

* *Cerceris velox*.

Male.—Length 3— $3\frac{1}{2}$ lines. Black, variegated with yellow and ferruginous; the anterior wings with their apex dark fuscous. Head: the front, clypeus, mandibles and scape in front yellow; mandibles rufo-picuous at their apex; the collar, tubercles, tegulæ, scutellum and post-scutellum, the apex of the metathorax and the legs, yellow; the posterior femora and tibiæ black; the former sometimes slightly ferruginous beneath, the latter yellow at their base; the posterior tarsi rufo-testaceous; the base of the metathorax ferruginous, with the enclosed triangular space black. Abdomen: the first, second and fourth segments ferruginous; the second yellow at its base, then black, with the apical portion ferruginous; the fourth segment has the apical half black; the following segments with broad yellow fasciæ.

Tribe ANTHOPHILA.

ANDRENIDÆ.

Nomia curvipes. (Pl. I. fig. 8.)

Andrena curvipes, Fabr. Ent. Syst. ii. 310, ♂.

Megilla curvipes, Fabr. Syst. Piez. 330, ♂.

Nomia curvipes, Oliv. Encycl. Méth. viii. 377, ♂.

Female.—Length $4\frac{1}{2}$ lines. Black: antennæ and legs rufo-fulvous, abdomen with greenish-yellow fasciæ. Head: the antennæ more or less rufo-piceous above; the face with bright fulvous pubescence, with a golden tinge; the mandibles ferruginous, rufo-piceous at their apex. Thorax clothed above with fulvous pubescence; the legs rufo-fulvous; the coxæ, trochanters and posterior femora rufo-piceous; wings fulvo-hyaline, the nervures and tegulæ rufo-testaceous. Abdomen: the apical margins of the first four segments greenish-yellow, the two apical fasciæ widest.

The male closely resembles the female, but has an additional fascia on the abdomen, all are frequently yellow, as described by Fabricius, but in some examples the fasciæ are tinged with green; the scape of the antennæ is yellow in front; the posterior femora, which are incrassate, are rufo-piceous, with their apical half yellow, as are also the tibiæ and tarsi, the tibiæ having a rufo-piceous stain near their base.

Hab.—India, Nuddea, Punjaub.

This is certainly, I think, the *Andrena curvipes* of Fabricius, but I am doubtful of its being the *Eucera crassipes* of that author, who describes the pubescence of the head and thorax as “cinereo-hirta.”

**Nomia oxybeloides.* (Pl. I. figs. 6 ♂, 6 a.)

Female.—Length 3 lines. Black; the pubescence silvery-white, the tegulæ large and of a reddish-yellow. Head closely punctured and shining, the face and cheeks with white pubescence; the flagellum of the antennæ more or less brightly fulvous beneath. Thorax shining, strongly and not very closely punctured; a transverse line of dense white short pubescence at the anterior and posterior margins of the mesothorax; the post-scutellum covered

with the same; the pubescence on the legs of a glittering silvery whiteness, dense on the posterior tibiæ; the apical joints of the tarsi rufo-testaceous; the wings hyaline. Abdomen: the margins of the segments with silvery-white pubescent fasciæ.

Male.—Strongly resembles the female in general appearance; black, with the legs rufo-piceous, varying greatly in depth of colour in different specimens, occasionally pale rufo-testaceous. Head: the face with white pubescence, or sometimes yellowish-white; the flagellum of the antennæ ferruginous beneath. Thorax above covered with a fine yellowish-white tomentum, usually more or less abraded on the disk; the post-scutellum covered with the same; the scutellum naked and punctured; wings hyaline, faintly clouded at their apex; the tegulæ very large, of a reddish-yellow; all the tarsi whitish; the posterior femora incrassate, greatly swollen exteriorly towards their apex; the tibiæ curved, rufo-testaceous towards their base, from thence white to their apex, which is flattened, and greatly produced, the tarsi appearing to be inserted midway into the exterior margin of the tibiæ. Abdomen strongly punctured, the base pubescent; the apical margins of the segments impunctate and covered with a very short yellowish-white pubescence.

This species has been received from several localities in India. In the Museum are specimens from the Himalayas; only males were known until Mr. Rothney forwarded the sexes.

Hab.—Nischiudipore.

**Nomia aurifrons.*

Female.—Length 4 lines. Black: the antennæ beneath and the legs ferruginous; the tibiæ and tarsi palest; the femora and coxæ frequently rufo-piceous; the pubescence principally golden-yellow. The face and cheeks with golden pubescence, that on the cheeks palest. The mesothorax with a short, fine, fulvous pubescence; the post-scutellum and prothorax covered with pale yellow tomentum, the rest of the thorax and the legs with a pale glittering golden pubescence; wings fulvo-hyaline, faintly clouded at their apex; the nervures pale ferruginous. Abdomen, in some examples, slightly ferruginous at the base; the first segment has a fine, golden, short, downy pubescence at the base, and this and the following seg-

ment have a narrow fascia, the other segments being covered with similar pubescence, but of a brighter colour.

Hab.—Silhet ; Barrackpore.

**Nomia Elliotii*. (Pl. I. fig. 7.)

Female.—Length 4—4½ lines. Black: the abdomen with green or blue-green fasciæ on the apical margins of the abdominal segments. The head and thorax above slightly shining, and closely and very finely punctured. Head: the antennæ have the flagellum slightly fulvous at the apex beneath; the face and cheeks with white pubescence. Thorax: a narrow line of white pubescence at the anterior margin of the mesothorax, another at its apical margin, and the post-scutellum, which is armed with two spines, covered with the same; wings sub-hyaline, their apical margins faintly clouded; the exterior margin of the tegulæ pale testaceous, or sometimes white; the legs have a pale glittering pubescence, which is very bright on the basal joint of the tarsi outside and on the posterior tibiæ. Abdomen smooth and shining, with four bright green fasciæ.

Male.—Closely resembles the female; but has the posterior femora incrassate and greatly swollen, being thickest in the middle; the tibiæ curved and produced at their apex beneath into a fulvo-testaceous blunt process; this sex, as well as the female, has the scutellum emarginate posteriorly, the angles being acute or subdentate, and has also two spines on the post-scutellum.

Var. The posterior legs with the femora ferruginous in both sexes, but usually more or less black above.

Hab.—Madras ; Barrackpore ; Nischindipore.

The male of this species has been in the Museum Collection for upwards of twenty years, during which time the name given has been attached; it was proposed in honour of the donor, but the description has not been published; Mr. Rothney has taken both sexes.

Nomia simillima. (Pl. II. fig. 4.)

Male.—Length 3½ lines. Black: the head and thorax rather finely punctured; the abdomen has a narrow greenish-white fascia on the apical margins of the first four segments; the posterior femora and tibiæ ferruginous. The face and cheeks with a silvery-white pubescence.

Thorax: a line of white pubescence at the anterior and posterior margins of the mesothorax; the post-scutellum covered with the same; the scutellum emarginate behind, the lateral angles of the emargination sub-dentate; the post-scutellum armed with two acute spines; wings hyaline, with a faint cloud at their apex; the outer margin of the tegulæ pale testaceous; the posterior femora incrassate; the tibiæ curved, thickened and produced at their apex into a blunt process; the tarsi black, with the base of the first joint more or less ferruginous. The abdomen smooth and shining, rufo-testaceous beneath.

Very like *N. Ellioti*, but smaller and distinguished by the colour of the posterior legs.

Hab.—Barrackpore.

**Nomia scutellata*.

Female.—3 lines. Black: the pubescence cinereous except that on the thorax above, which is fulvous; the abdomen with white pubescent fasciæ. Head: the flagellum of the antennæ more or less fulvous beneath; the face and cheeks with bright white pubescence. Thorax: the disk with sparing short fulvous pubescence, becoming more dense towards the scutellum, on which it is dense and bright; the pubescence on the legs, sides of the mesothorax and beneath cinereous; wings sub-hyaline; the nervures fuscous; the stigma and tegulæ pale ferruginous. The apical margins of the segments with white fasciæ, except the apical one, which has a dark fuscous fringe.

Hab.—Calcutta.

**Nomia thoracica*. (Pl. I. fig. 10.)

Female.—Length 4—5 lines. Black: the coxæ and femora rufo-piceous; the tibiæ and tarsi pale ferruginous, the anterior and intermediate tibiæ usually darkest; the first and three following segments of the abdomen above have narrow white margins. The head with pale glittering pubescence; the flagellum of the antennæ fulvous beneath. The pubescence on the disk of the mesothorax and scutellum very short, dense and fulvous; that on the post-scutellum is much paler, as it is also on the legs and thorax beneath; wings sub-hyaline; the nervures and tegulæ ferruginous; the costal nervure and stigma fuscous. Abdomen very finely and closely punctured.

Male.—Closely resembles the female, but the legs are black with the tarsi rufo-piceous, the apical joints being palest; the posterior femora incrassate, being greatly swollen at their apex; the tibiæ curved, exteriorly much swollen and thickened gradually to their apex, which beneath is pale testaceous. Abdomen: the apical margins of the second and following segments narrowly white; punctured as in the female, but more pubescent at the sides and at the base.

Hab.—Barrackpore; China.

**Nomia antennata*. (Pl. I. figs. 9, 9a.)

Female.—Length $5\frac{1}{2}$ lines. Black: the pubescence fulvous, which is more or less pale; the abdomen with fasciæ of the same. Head: the antennæ, except the scape and two basal joints of the flagellum, fulvous beneath; the face covered with pale, fulvous, short pubescence, which has a golden tint in certain lights; the cheeks and the legs are clothed with the same; on the mesothorax, above, the pubescence is rich fulvous; a line of short, paler pubescence on the post-scutellum; the wings hyaline, their apex, beyond the marginal cell, fuscous; the nervures ferruginous; the tarsi of the same colour. The apical margins of the four basal segments of the abdomen with fasciæ of pale fulvous pubescence.

Male.—The general colour and the pubescence as in the opposite sex; the antennæ as long as the head and thorax; the scape and the apical joint black, the latter enlarged and compressed into an irregular circular formation nearly thrice the diameter of the previous joint. The posterior legs have the femora greatly enlarged, the tibiæ curved and greatly dilated at and towards their apex. The abdomen with similar pubescent fasciæ to those on the female.

Hab.—India; Bombay Presidency.

This species does not form part of Mr. Rothney's collection, it was obtained from that of Captain Laing, and was taken near Lucknow; it is described from specimens in the British Museum, and is incorporated in this paper solely in consequence of its having capitate antennæ; it will be observed that the club is composed of a single joint; in the new genus, *Cyathocera*, it is two-jointed.

Genus CYATHOCERA.

Head subovate, as wide as the thorax, the ocelli placed in a slight curve on the vertex; the maxillary palpi six-jointed, the basal joint stoutest, the joints gradually decreasing in width to the apical one, and also in length, but only slightly so; the labium short and lanceolate, the paraglossæ two-thirds of the length of the labium; the mandibles bidentate in the female, the teeth blunt; in the male they are edentate and acute at their apex. The wings with one oblong marginal cell, rounded at its apex, three submarginal cells, the second one-third longer than the first, receiving the two recurrent nervures, each at about one-fourth of the length of the cell, the tegulæ enlarged in both sexes; thorax ovate, the posterior legs have the femora fringed with pubescence beneath, and the tibiæ and basal joint of the tarsi furnished with a dense scopa; in the male the posterior legs have the femora enlarged and the tibiæ curved, with the apex dilated. Abdomen sub-ovate.

In the female the antennæ are short, filiform, with the terminal joint acute at the apex, not reaching to the tegulæ; the male has the antennæ elongate, reaching to the first segment of the abdomen, filiform, with the two apical joints dilated, compressed, forming a somewhat pear-shaped node, concave beneath or spatulate.

* *Cyathocera nodicornis*. (Pl. I. figs. 5 ♂, 5a, 5b.)

Female.—Length $3\frac{1}{4}$ lines. Head, thorax, coxæ and basal margins of the third, fourth and fifth segments of the abdomen above black; legs and abdomen, otherwise, ferruginous. Head: antennæ ferruginous; the face as high as the ocelli, and the cheeks covered with bright gold-coloured pubescence; the clypeus naked and strongly punctured; tips of the mandibles rufo-piceous. The meso- and meta-thorax smooth and shining; the prothorax, a narrow line at the basal margin of the scutellum, the post-scutellum, and sides of the metathorax, have a covering of rich yellow tomentum; the legs have a pale, glittering, yellow pubescence; the wings subhyaline, and dark fuscous beyond the marginal cell; the tegulæ large and ferruginous. Abdomen: the second, third and fourth segments have laterally, in very fine examples, at their basal margins an oblong macula of white pubescence;

these are usually more or less obliterated; the fourth and following segments covered with golden pubescence.

Male.—Agreeing with the other sex in size and general resemblance; the wings fuscous at their apex, the tegulae proportionally larger. The antennae a little longer than the head and thorax, ferruginous, with the two apical joints black, enlarged, flattened and forming a somewhat pear-shaped node or club. The posterior femora swollen, widest at their apex; the tibiae have their apical half dilated, their inferior apex being compressed into a thin, rounded, flat plate. The apical margins of the segments of the abdomen strongly punctured, the entire abdomen being smooth in the female.

Of this remarkable genus two females were obtained by the British Museum from Captain Laing's collection; they were taken near Lucknow some time previous to 1870. Mr. Rothney captured both sexes near Pulta, Barrackpore; he reports the species to be extremely local. The plant it frequented appeared to be a species of *Pulicaria*.

APIDÆ.

Cælixys argentifrons.

Male.—Length $4\frac{1}{2}$ lines. Black: the head and thorax semi-opaque and very closely punctured; abdomen shining, rather closely and finely punctured; wings slightly fuscous, becoming clear hyaline towards the base. The face densely covered with silvery-white pubescence; the cheeks, the thorax at the sides and beneath, the legs, and the abdomen beneath, have a fine, short, silvery-white pubescence; the segments of the abdomen have each a lateral patch of fine, short, white pubescence; the patches extend over both the basal and apical margins, they are widest laterally, and are attenuated to a point inwardly, and do not extend to the middle of the segments. The apical segment has a slender, acute tooth on each side at its base; the apex deeply notched or grooved, the lateral projections form short rounded teeth above, and short acute ones beneath, all being of the same length. The tooth at the lateral angles of the scutellum is very short and blunt.

Cælixys basalis.

Female.—Length 7 lines. Black: the abdomen shining, elongate and tapering to an acute point. The vertex,

thorax above and the scutellum rugose; the sides and pectus strongly punctured; a stout acute tooth curved downwards at the lateral angles of the scutellum; the segments of the abdomen evenly and moderately punctured, most finely so at their basal margins; the apical segment smooth and lanceolate at its apex; the inferior valve narrower, more acute, and extending a little beyond the upper one. The wings hyaline to one-third of their length from the base, beyond which they are dark fuscous. The face covered with snow-white pubescence, that on the clypeus is downy and fulvous along the anterior margin; the margins of the abdominal segments with a narrow white pubescent fringe, which slightly widens laterally.

Male.—Length 5—5½ lines. Closely resembles the female; the clypeus has not any fulvous pubescence at its anterior margin, but, as well as the face, is densely covered with white pubescence; the head is a little wider than the thorax; the wings as in the female; the apical segment has the upper valve armed with eight teeth, a short acute one on each side at its base, a deep notch or short groove at the apex, in the middle, forms two other somewhat blunt teeth, beyond these the margin terminates on each side in a short acute tooth; the apex beneath these four teeth terminates in two longer acute teeth or spines.

The general resemblance of these sexes quite warrants their being united as constituting one species.

Calioxys cuneatus.

Female.—Length 5 lines. Black, shining and punctured; the abdomen with narrow white uninterrupted abdominal fasciæ. Head and thorax strongly punctured; the face and cheeks covered with white pubescence. Thorax: a small spot of white pubescence at the anterior margin of the mesothorax, two at the basal margin of the scutellum, and also a minute one behind the tegulæ; the sides and beneath as well as the legs with fine, short, white pubescence; a short blunt tooth at the lateral angles of the scutellum; the wings slightly fuscous, becoming hyaline towards their base. Abdomen wedge-shaped, gradually tapering from the base to the apex; the marginal fasciæ widest laterally and continued on the margins beneath.

Cælioxys confusus.

Female.—Length 4—5 lines. Black: the head and thorax strongly and closely punctured, the abdomen much more finely and less closely so, the apical segment smooth, the sides punctured towards the apex; the wings fuscous beyond the first submarginal cell, their basal portion hyaline; the face and also the cheeks covered with white pubescence; the thorax at the side and beneath and also the legs have a fine, thin, white pubescence; a short rather blunt tooth at each lateral angle of the scutellum; a narrow white marginal fascia on the margins of the segments of the abdomen; it is slightly widened at their sides. The apex of the apical segment acute; the lower valve of the segment is also acute and extends a little beyond the upper valve, which has a central carina, that runs from the apex half-way towards the base.

This species, although distinct from, is very like *C. fuscipennis*, also from India, but its apical segment is very much narrower. In *C. fuscipennis* it is somewhat spoon-shaped.

Nomada adusta.

Female.—Length 3 lines. Ferruginous, with black and yellow markings; wings hyaline, the anterior pair fuscous at their tips. Head: the clypeus and face, as high as the insertion of the antennæ, yellow. Thorax: the scutellum, post-scutellum, the tubercles and collar yellow. Abdomen: a black spot on each side of the basal segment, its apical margin fusco-ferruginous; the second segment with a broad, sub-interrupted, yellow fascia at its basal margin; the rest of the segment, as well as the following segments, dark rufo-piceous; the third segment has a yellow fascia on its apical margin; the following segment has two large united yellow maculæ; the apical segment covered with silvery-white pubescence.

The male resembles the female, but its general colouring is darker, the thorax being black with ferruginous stains; the antennæ dark fuscous above.

Anthidium rasorium.

Female.—Length $2\frac{3}{4}$ lines. Black: an interrupted yellow fascia on each abdominal segment; the legs, and abdomen beneath, ferruginous. Head very closely and finely punctured; the clypeus, face as high as the insertion

of the antennæ, a spot on the mandibles and a line behind the eyes, and on the margin of the vertex, white. Thorax very closely punctured; a yellow line passes over the tegulæ and runs on to the posterior margin of the scutellum; wings hyaline and iridescent, the tegulæ rufo-testaceous; the basal joint of the posterior tarsi cream-coloured. The head, thorax and legs with short cinereous pubescence. Abdomen: a yellow fascia in the middle of each segment; that on the first only commenced at the sides, the second widely interrupted, the rest narrowly so; the sixth with a large cordate-shaped spot; clothed beneath with pale fulvous pubescence.

Male.—Closely resembles the female; the face has the white colouring extended above the insertion of the antennæ, a spot in front of the anterior ocellus, and the mandibles, white; the anterior margin of the mesothorax with an interrupted white line; the tegulæ in front, the tubercles and a white stripe passing from them down the sides and also beneath the thorax, the legs also striped with white; the fasciæ on the abdomen scarcely interrupted.

Hab.—Barrackpore; Bombay Presidency.

Mr. Rothney found this insect at Barrackpore; Dr. Leith took it in the latter district.

DESCRIPTION OF PLATE I.

1. *Meranoplus bicolor*, ♂. 1a. Antenna of ditto.
2. " " ♀. 2a. "
3. " " ♂.
4. *Pseudomyrma bicolor*, ♀.
5. *Cyathocera nodicornis*, ♂. 5a. Antenna of ditto. 5b. Posterior leg of ditto.
6. *Nomia oxybeloides*, ♂. 6a. Posterior leg of ditto.
7. Posterior leg of *Nomia Elliotii*, ♂.
8. " " *curvipes*, ♂.
9. " " *antennata*, ♂.
10. " " *thoracica*, ♂.